

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/623486

INTERNATIONAL APPLICATION NO.
PCT/JP99/01323INTERNATIONAL FILING DATE
17 March 1999PRIORITY DATE CLAIMED
19 March 1998

TITLE OF INVENTION

RESIN COMPOSITION

APPLICANT(S) FOR DO/EO/US

Yasuki MIURA, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☐ A change of power of attorney and/or address letter.
18. ☐ Certificate of Mailing by Express Mail
19. ☒ Other items or information:

Request for Consideration of Documents Cited in International Search Report

Notice of Priority

PCT/IB/304

PCT/IB/308

Drawing (1 sheet)

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :
YASUKI MIURA ET AL : ATTN: NEW APPLICATION DIVISION
SERIAL NO: NEW APPLICATION :
(Based on PCT/JP99/01323)
FILED: HEREWITH :
FOR: RESIN COMPOSITION :

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

Claim 3, line 1, delete "or 2";

line 2, replace "7" with --70--;

line 3, replace "3" with --30--.

Claim 4, line 1, delete "2 or 3".

Claim 5, lines 1-2, replace "any one of Claims 1 to 4" with --Claim 1--.

Claim 7, lines 1-2, replace "any one of Claims 1 to 6" with --Claim 1--.

Claim 8, line 2, replace "any one of Claims 1 to 7" with --Claim 1--.

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REMARKS

Claims 1-8 are active in the present application. The claims are amended for clarity and to remove multiple dependencies. Support for the amendment to Claim 3 is found at page 8, line 15. No new matter has been added. Applicants submit that the present application is now in condition for examination on the merits. Early notification of such is earnestly solicited.

Respectfully submitted,

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DESCRIPTIONRESIN COMPOSITIONTECHNICAL FIELD

The present invention relates to a resin composition
5 comprising a polyphenylene sulfide (hereinafter referred
to as PPS) and a fluorinated resin, particularly to a
resin composition whereby the dimensional accuracy of a
three-dimensional molded product obtainable by an
injection molding method is remarkably improved.

10 BACKGROUND ART

PPS is known as a resin excellent in heat
resistance, solvent resistance, electrical properties,
mechanical strength, dimensional stability, flame
retardancy, etc. and its applications include a material
15 for parts of electrical and electronic appliances, a
material for parts of automobiles, a material for parts
of chemical equipments and material for other functional
parts.

In majority of such applications, parts formed by an
20 injection molding method are employed. However, the
required properties are finely divided. For example,
among parts which used to be processed by metal cutting
processing etc., there are ones which are required to
have particularly high dimensional accuracy, and it has
25 been difficult to substitute PPS for them.

The reason has been such that PPS has a low
polymerization degree and is usually combined with e.g.

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an inorganic filler or a fiber-reinforcing agent such as glass fibers or carbon fibers to have properties useful as an engineering plastic, but when it is injection-molded, a phenomenon is likely to occur wherein depending upon the direction of alignment of the fiber reinforcing material, the dimension of the molded product differs, whereby a predetermined dimensional accuracy tends to be hardly obtainable.

Further, when an inorganic filler which brings about no problem of the alignment direction, such as glass beads, zinc oxide or calcium carbonate, is incorporated to PPS, the problem of alignment of the filler at the time of injection molding, will be solved, but fluctuations among molding shots tend to be large, and the required dimensional accuracy can not be satisfied.

For example, in order to obtain high dimensional accuracy of a three-dimensional molded product, there is a proposal such that a composition comprising PPS and a certain specific silane-treated silica powder, is molded into a connector ferrule for optical fiber (JP-A-6-299072), or a composition having from 0.5 to 5 wt% of PPS blended to a tetrafluoroethylene (hereinafter referred to as TFE)/perfluoro(alkylvinyl ether) (hereinafter referred to as PAVE) copolymer (hereinafter referred to as PFA), is used for lining by a rotational molding method (JP-A-5-112690). However, such compositions are different in the compositional ratio from the composition of the

present invention.

There are also a proposal to obtain a molded product having the dimensional stability in oil and abrasion resistance improved by insert molding a cylinder piston from a composition comprising specific amounts of PPS, a fluorinated resin, a spherical filler and a fibrous filler (JP-A-3-74681), a proposal to obtain a molded product made of a composition comprising PPS, a polyvinylidene fluoride (hereinafter referred to as PVdF) and a homopolymer or copolymer of TFE (JP-A-5-29520), and a proposal to improve the mutual dispersibility of PPS and a fluorinated resin in a composition comprising PPS, a fluorinated resin having a melting point of at most 320°C and an aminoalkoxy silane and thereby to improve the mechanical strength of its molded product (JP-A-8-53592). However, there is no disclosure as to whether or not a molded product having high dimensional accuracy can thereby be obtained.

DISCLOSURE OF THE INVENTION

An object of the present invention is to provide a resin composition comprising PPS, a fluorinated resin and further a filler, whereby a three-dimensional molded product having high dimensional accuracy, can be obtained by injection molding.

The present inventors have conducted a study diligently and as a result, they have found it possible to accomplish the above object by incorporating to PPS a

specific amount of a fluorinated resin having a solidification temperature higher than PPS and thus have arrived at the present invention.

Namely, the present invention provides a resin composition which comprises the following (a) and the following (b) in a proportion of from 50 to 99.5 wt% of (a) and from 0.5 to 50 wt% of (b) in the total amount of (a) and (b). Further, it provides the above resin composition which further contains the following (c) in a ratio of more than 0 part by weight and not more than 250 parts by weight in the total amount per 100 parts by weight of the total amount of (a) and (b).

(a) a polyphenylene sulfide;

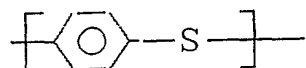
(b) a fluorinated resin having a solidification temperature (T_{mc}) of at least 237°C when cooled at a cooling rate of 10°C/min after melting in a nitrogen atmosphere at 330°C; and

(c) at least one member selected from the group consisting of an organic reinforcing material, an inorganic reinforcing material and a filler.

BEST MODE FOR CARRYING OUT THE INVENTION

PPS (a) to be used in the present invention, is a polymer comprising repeating units of a structure which is substantially represented by the formula 1 and is a random copolymer or a block copolymer containing at least 70 mol%, preferably at least 90 mol%, of such repeating units. If the repeating units are less than 70 mol%, it

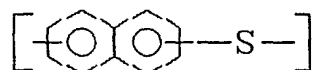
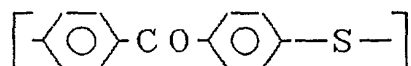
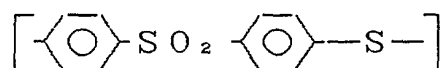
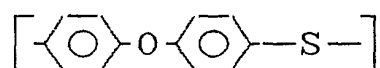
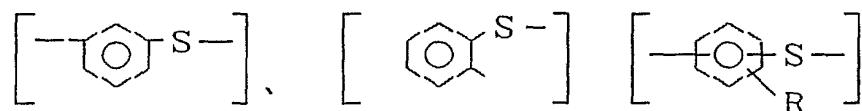
tends to be difficult to obtain a composition which satisfies the purpose of the present invention.



Formula (1)

5

Copolymer units other than the repeating units of the structure represented by the formula 1, may be present in a ratio of less than 30 mol%, preferably less than 10 mol%, in PPS (a) and may contain units of arylene sulfide structures represented by the following structures, within a range not to lower the crystallinity of the polymer.



25

(R represents an alkyl group, a nitro group, a phenyl group, an alkoxy group, a carboxyl group or a metal

carboxylate group.)

PPS (a) can be obtained by various known polymerization methods. A method of reacting sodium sulfide with p-dichlorobenzene in an amide type solvent such as N-methylpyrrolidone or dimethylacetamide or in a sulfone type solvent such as sulfolane, is suitable. In such a case, it is preferred to add an alkali metal carboxylate such as sodium acetate or lithium acetate to control the degree of polymerization.

PPS (a) can be used, washed after completion of the polymerization. Further, one which is treated with an aqueous solution containing an acid such as hydrochloric acid or acetic acid or with a water/organic solvent mixed solution, or one which is treated with a solution of a salt such as ammonium chloride, may also be used. The melt index of PPS (a) is preferably from 0.1 to 500, particularly preferably from 1 to 300, as measured under conditions of a cylinder temperature of 300°C, a load of 5 kg, an orifice diameter of 2.095 mm and a length of 8 mm. If the melt index is less than 0.1, the fluidity at the time of injection molding tends to be poor, and if it exceeds 500, the mechanical strength of the molded product tends to be low, such being unsuitable for industrial parts.

The fluorinated resin (b) is a fluorinated resin having a solidification temperature (T_{mc}) of at least 237°C when cooled at a cooling rate of 10°C/min after

melting in a nitrogen atmosphere at 330°C.

Specifically, PFA or TFE/hexafluoropropylene (hereinafter referred to as HFP) copolymer (hereinafter referred to as FEP) may be mentioned.

5 PFA is preferably one wherein the carbon number of the alkyl group of PAVE as its polymer component is from 1 to 6, and polymer units based on PAVE are from 1 to 5 mol%, which is commercially available. As PAVE, perfluoro(propylvinyl ether), perfluoro(ethylvinyl ether)
10 or perfluoro(methylvinyl ether) is preferred, and particularly preferred is perfluoro(propylvinyl ether). PFA may contain polymer units based on two or more of them.

FEP is preferably one wherein polymer units based on
15 HFP are from 1 to 20 mol%, which is commercially available.

Further, as a fluorinated resin (b) other than PFA or FEP, a PAVE/HFP/TFE copolymer, and a polymer component other than PAVE or HFP/(PAVE and/or HFP)/TFE copolymer
20 may, for example, be employed. Preferred is one wherein, in such a copolymer, polymer units based on PAVE are from 0 to 5 mol%, polymer units based on HFP are from 0 to 20 mol%, and the total of polymer units based on PAVE and HFP is from 1 to 20 mol%. Specifically, a copolymer may
25 be employed which contains, for example, 0.5 mol% of polymer units based on perfluoro(propylvinyl ether) and 7.0 mol% of polymer units based on HFP.

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The melt index of such a fluorinated resin (b) is not particularly limited but is preferably at least 0.1 as measured under conditions of 330°C, a load of 5 kg, an orifice diameter of 2.095 mm and a length of 8 mm, as the
5 resin is thereby readily dispersible. The measuring conditions for the melt index are stipulated by ASTM D1238.

Further, such a fluorinated resin (b) can be produced by various conventional polymerization methods
10 such as suspension polymerization, emulsion polymerization and solution polymerization.

The blend ratio (a)/(b) of PPS (a) to the fluorinated resin (b) for the composition of the present invention is from 50/50 to 99.5/0.5 by weight ratio.
15 Particularly preferred is from 70/30 to 95/5 (weight ratio). If the weight ratio of PPS is less than 50/50, the fluorinated resin tends to hardly form an island structure clearly, and if it exceeds 99.5/0.5, the amount of the fluorinated resin tends to be small, whereby the
20 effect of the present invention can not be expected. In the matrix of the composition, it is preferred that the sea portion is formed by PPS, and the island portion is formed by the fluorinated resin.

The effect that a molded product obtainable from the
25 composition of the present invention has high dimensional accuracy, is likely to be obtainable when the fluorinated resin solidifies before the solidification of PPS (a).

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With respect to the mechanism of generation of this effect, (1) by the incorporation of the fluorinated resin (b) to PPS (a), the pressure loss of the injection pressure decreases during the passage of the molten composition through the gate of the mold. The reason for this is believed to be such that the fluorinated resin functions as an internal lubricant. As a result, the injection pressure is effectively transmitted to the composition in the mold. The cross section of the mold is shown schematically in Figure 1. Reference numeral 1 represents a sprue, 2 a runner, 3 a pin gate and 4 a molded product.

(2) The fluorinated resin (b) solidifies before gate sealing i.e. in a state where the maintained pressure is effectively acting on the composition in the mold, and PPS (a) solidifies after the gate sealing. Via this solidification process of two steps, the volume shrinkage after gate sealing is reduced. It is considered that by the above functions, fluctuations among molding shots and the mold transferability are suppressed, whereby the effects of the present invention are generated.

Specifically, a molded product obtainable by injection molding at a cylinder temperature of 330°C and a mold temperature of 150°C as shown in the Examples of the composition of the present invention, has excellent dimensional accuracy such that the size difference between position A and position B of the molded product

shown in Figure 2, and the difference between the maximum size and the minimum size at position B by 100 shot molding, are about 1/10 of the differences in conventional composition. Figure 2 is a cross-sectional
5 view of the molded product and shows the dimensional shape. In Figure 2, the unit of the size is mm, and D1 represents a diameter of 25.0, D2 a diameter of 19.0, D3 a diameter of 35.0, D4 a diameter of 24.6, D5 a diameter of 22.8, D6 a diameter of 19.6, L1 35.0, L2 20.0, L3 5.4,
10 L4 3.0, L5 8.0 and L6 2.0.

Further, the composition of the present invention contains (c) an organic reinforcing material, an inorganic reinforcing material or a filler in addition to (a) and (b), and it may contain at most 250 parts by
15 weight of (c) an organic reinforcing material, an inorganic reinforcing material or a filler, per 100 parts by weight of the total of (a) and (b). If component (a) exceeds 250 parts by weight, injection molding tends to be difficult. Further, injection molding can be carried
20 out even if component (c) is not incorporated.

Specific examples of component (c) include an organic filler such as thermosetting resin powder, an inorganic filler such as ferrite, mica, silica, talc, alumina, kaolin, calcium sulfate, calcium carbonate,
25 graphite, titanium oxide, zinc oxide or carbon black, an inorganic reinforcing material such as glass fiber, carbon fiber or whisker of e.g. potassium titanate or

5 to the compounding.

may be added as the case requires.

15 · having a kneading function, is employed.

to 13), but the present invention is not thereby limited.

20 Measurement of the solidification temperature

25 for 5 minutes and then cooled it from 330°C to 100°C at

10°C/min.

Raw materials used

PPS: M-2100 (solidification temperature: 237°C),
manufactured by Toray Corporation.

PTFE: Fluone PTFE L-150J (no solidification
5 temperature), manufactured by Asahi Glass Company,
Limited.

PFA: Aflone PFA P-61 (solidification temperature:
271°C), manufactured by Asahi Glass Company, Limited.

FEP: Aflone FEP (solidification temperature: 241°C),
10 manufactured by Asahi Glass Company, Limited.

ETFE: Aflone COP C88AX (solidification temperature:
230°C), manufactured by Asahi Glass Company, Limited.

Low melting point ETFE (hereinafter referred to as
LM-ETFE): Aflone LM740 (solidification temperature:
15 206°C), manufactured by Asahi Glass Company, Limited.

PVdF: Neoflone VP800 (solidification temperature:
150°C), manufactured by Daikin K.K.

Glass fiber: 03MAFT562, manufactured by Asahi Fiber
Glass Company, Limited.

20 Spherical silica: FB-35, manufactured by Denki
Kagaku Kogyo K.K.

Calcium carbonate: NS200, manufactured by Nitto
Funka Kogyo K.K.

The glass fiber, the spherical silica and the
25 calcium carbonate were not surface treated with e.g. a
silane coupling agent before compounding.

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EXAMPLES 1 to 6

Introducing PPS and a filler into a hopper of a first feeder and a fluorinated resin into a hopper of a second feeder, of a same directional twin screw extrusion kneader having screws having two kneading portions set, in a weight ratio as shown in Table 1, the raw materials were kneaded at a cylinder temperature of 320°C at a screw rotational speed of 100 rpm while vacuuming from a vent by a vacuum pump, and a discharged strand was annealed and then cut into a length of 3 mm by pelletizer to obtain a composition.

The cylinder temperature of an electrically operated type molding machine with a mold clamping of 30 tons, was set at 330°C. The prepared composition was injected through a pin point gate with three points, as shown in Figure 1 and injection-molded by a mold engraved with a flanged cylindrical sleeve-shape and heated to 150°C by a heating medium, under a condition of 800 kg/cm² at an injection rate of 80 mm/sec., to obtain a molded product.

With respect to the obtained molded product, the outer diameters at positions A and B in Figure 2 were measured by a laser scanning micrometer (manufactured by Mitsutoyo K.K.). The size difference (μm) between position A and position B (hereinafter referred to as the A/B size difference), and the difference (μm) between the maximum size and the minimum size of 100 shots molded products at position B (hereinafter referred to as the B

size difference) are shown in Table 1.

Table 1

Composition	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7
PPS	90	90	90	90	90	90	100
Fluorinated resin: PTFE			10				
PFA	10						
FEP		10					
ETFE				10			
LM-ETFE					10		
PVdF						10	
Filler: Spherical silica	100	100	100	100	100	100	100
A/B size difference	4	6	42	23	30	50	21
B size difference	6	7	58	25	23	43	55

EXAMPLES 7 to 12

Introducing PPS and a filler into a hopper of the
 5 first feeder and a fluorinated resin into a hopper of the
 second feeder, of the kneader used in Examples 1 to 6, in
 the weight ratio as identified in Table 2, and further
 introducing glass fiber into the extruder by a side
 feeding method, kneading was carried out in the same
 10 manner as in Examples 1 to 6 to obtain a composition,
 which was then molded to obtain a molded product. The
 results of the outer diameters measured with respect to
 the molded product, are shown in Table 2.

Table 2

Composition	Ex. 8	Ex. 9	Ex. 10	Ex. 11	Ex. 12	Ex. 13
PPS	90	90	90	90	90	90
Fluorinated resin: PTFE			10			
PFA	10					
FEP		10				
ETFE				10		
LM-ETFE					10	
PVdF						10
Filler: Calcium carbonate	40	40	40	40	40	40
Glass fiber	60	60	60	60	60	60
A/B size difference	8	10	82	43	50	70
B size difference	9	8	68	25	19	33

INDUSTRIAL APPLICABILITY

With the resin composition of the present invention, the dimensional accuracy of a molded product having a three-dimensional shape, obtainable by injection molding thereof, is very high, and accordingly, it is useful for application to various parts or structural materials, for automobile or household electrical appliances and electronic fields.

CLAIMS

1. A resin composition which comprises the following (a) and the following (b) in a ratio of from 50 to 99.5 wt% of (a) and from 0.5 to 50 wt% of (b) in the total amount
5 of (a) and (b):

(a) a polyphenylene sulfide; and

(b) a fluorinated resin having a solidification temperature (T_{mc}) of at least 237°C when cooled at a cooling rate of 10°C/min after melting in a nitrogen
10 atmosphere at 330°C.

2. The resin composition according to Claim 1, which further contains the following (c) in a ratio of more than 0 part by weight and not more than 250 parts by weight in the total amount per 100 parts by weight of the
15 total amount of (a) and (b):

(c) at least one member selected from the group consisting of an organic reinforcing material, an inorganic reinforcing material and a filler.

3. The resin composition according to Claim 1 or 2,
20 which comprises (a) and (b) in a ratio of from 7 to 95 wt% of (a) and from 5 to 3 wt% of (b) in the total amount of (a) and (b).

4. The resin composition according to Claim 1, 2 or 3, wherein the melt index of the fluorinated resin is at
25 least 0.1 as measured under measuring conditions of 330°C, a load of 5 kg, an orifice diameter of 2.095 mm and a length of 8 mm.

5. The resin composition according to any one of Claims 1 to 4, wherein the fluorinated resin is a tetrafluoroethylene/perfluoro(alkylvinyl ether) copolymer or a tetrafluoroethylene/hexafluoropropylene copolymer.

5 6. A resin composition which comprises the following (a) and the following (b¹) in a ratio of from 70 to 95 wt% of (a) and from 5 to 30 wt% of (b¹) in the total amount of (a) and (b¹) and which further contains the following (c) in a ratio of from 10 to 250 parts by weight in the total
10 amount per 100 parts by weight of the total amount of (a) and (b¹):

(a) a polyphenylene sulfide;

(b¹) a tetrafluoroethylene/perfluoro(alkylvinyl ether) copolymer or a
15 tetrafluoroethylene/hexafluoropropylene copolymer; and

(c) at least one member selected from the group consisting of an organic reinforcing material, an inorganic reinforcing material and a filler.

7. The resin composition according to any one of Claims
20 1 to 6, wherein the melt index of the polyphenylene sulfide is from 0.5 to 500 as measured under measuring conditions of 330°C, a load of 5 kg, an orifice diameter of 2.095 mm and a length of 8 mm.

8. A molded product obtained by injection molding of the
25 resin composition as defined in any one of Claims 1 to 7.

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ABSTRACT

A resin composition which comprises from 50 to 99.5 parts by weight of a polyphenylene sulfide and from 0.5 to 50 parts by weight of a fluorinated resin having a
5 solidification temperature of at least 237°C when cooled at a cooling rate of 10°C/min after melting in a nitrogen atmosphere at 330°C, and from 0 to 250 parts by weight of a filler, etc. per 100 parts by weight of the two components.

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FIG. 1

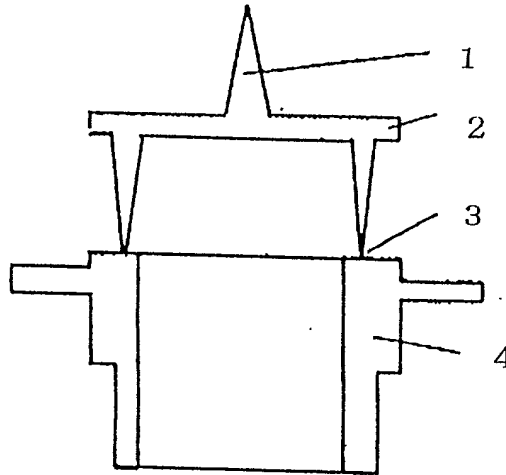
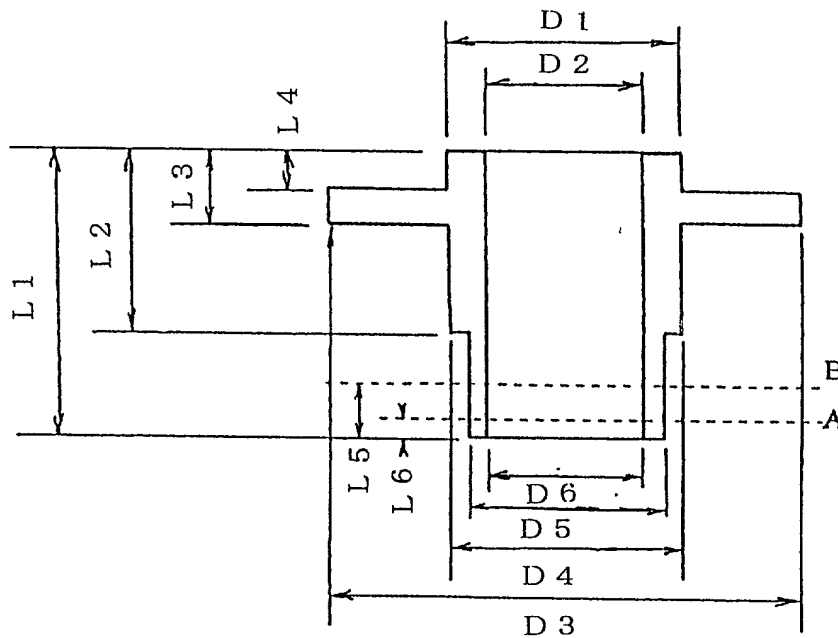


FIG. 2



Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の名称が複数の場合）であると信じています。

上記発明の明細書は、

- ☐ 本書に添付されています。
- ☐ ____月____日に提出され、米国出願番号または特許協定条約国際出願番号を____とし、
(該当する場合) ____に訂正されました。

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

RESIN COMPOSITION

the specification of which

- ☐ is attached hereto.
- ☒ was filed on March 17, 1999
as United States Application Number or
PCT International Application Number
PCT/JP99/01323 and was amended on
____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration

(日本語宣言書)

私は、米国法典第35編119条 (a) - (d) 項又は365条 (b) 項に基づき下記の、米国外の国の少なくとも一カ国を指定している特許協力条約365 (a) 項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

Prior Foreign Application(s)

外国での先行出願

10-070848

(Number)
(番号)

Japan

(Country)
(国名)

(Number)
(番号)

(Country)
(国名)

私は、第35編米国法典119条 (e) 項に基づいて下記の米国特許出願規定に記載された権利をここに主張いたします。

(Application No.)
(出願番号)

(Filing Date)
(出願日)

私は、下記の米国法典第35編120条に基づいて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約365条 (c) に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

PCT/JP99/01323

(Application No.)
(出願番号)

March 17, 1999

(Filing Date)
(出願日)

(Application No.)
(出願番号)

(Filing Date)
(出願日)

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I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Claimed

優先権主張

19/March/1998

(Day/Month/Year Filed)
(出願年月日)

☒

Yes

はい

☐

No

いいえ

(Day/Month/Year Filed)
(出願年月日)

☐

Yes

はい

☐

No

いいえ

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.)
(出願番号)

(Filing Date)
(出願日)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

Pending

(Status: Patented, Pending, Abandoned)
(現況: 特許許可済、係属中、放棄済)

(Status: Patented, Pending, Abandoned)
(現況: 特許許可済、係属中、放棄済)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration

(日本語宣言書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。
(弁護士、または代理人の指名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

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(第三以降の共同発明者についても同様に記載し、署名すること)

(Supply similar information and signature for third and subsequent joint inventors.)

Japanese Language Declaration
(日本語宣言書)

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第五の共同発明者の氏名		Full name of fifth joint inventor, if any	
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第六の共同発明者の氏名		Full name of sixth joint inventor, if any	
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国籍		Citizenship	
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(第六またはそれ以降の共同発明者に対しても同様な情報および署名を提供すること。)

(Supply similar information and signature for third and subsequent joint inventors.)